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Squaw Creek watershed social assessment: Values, beliefs, and perceptions of water quality and landscape change

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Abstract: Selected residents of three central Iowa counties were surveyed to determine their thoughts and opinions on water quality issues in the Squaw Creek watershed basin.

Question & Answer

Q: How can all stakeholders have equal representation in a watershed planning project when typically only residents who attend public meetings have a voice?

A: This research developed a new methodology that benefits farmers by allowing their voices to be equally represented along with urban residents and city-county officials. Continued research and development of this tool (and its use) will ensure that the voices of farmers are always represented in planning projects that affect them.

Background

The Squaw Creek watershed basin includes approximately 150,000 acres of predominantly agricultural land in three central Iowa counties: Hamilton, Boone, and Story. The communities of Stanhope, Stratford, Gilbert, and Ames are included in the drainage basin.

The objective of this project was to characterize the biophysical and social conditions related to water quality and landscape change in the Squaw Creek watershed. These elements could be used to structure future water quality enhancement strategies, including watershed planning projects that encourage participant cooperation and participation necessary for success.

Approach and methods

One-on-one confidential assessment interviews were conducted with 59 specifically chosen residents (20 percent from Hamilton County, 32 percent from Boone County, and 50 percent from Story County). Efforts were made to include people reflecting the full range of values, attitudes, and beliefs present in the watershed. The research was not intended to convey statistically representative responses of the watershed population but was aimed at sampling the range of conditions present. Among the stakeholder groups represented were farmers, rural residents, institutional/Iowa State University, urban residents, city-county government representatives, and business owners and developers.

The majority of results reported were perceptions—thoughts, ideas, and experiences that were shared openly with the researchers. Two methods, open-ended direct questioning and photo elicitation, were utilized because they were best suited to reveal individual perspectives in a non-threatening, comfortable manner. Data from the interviews were compared with information gathered from local newspapers and technical experts.

Elements and aspects included in the assessment were chosen specifically for water quality conditions and landscape changes relative to the Squaw Creek watershed. However, these elements are considered to be basic, contextual aspects for participants in any watershed or landscape planning effort. All subjects were asked about their

- definition of “water quality problems”;
- understanding of the pollutants and transport mechanisms from both urban and rural sources;

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- understanding of landscape changes made by water quality specialists that are assumed to be impacting water quality in the watershed;
- understanding of landscape and watershed processes;
- knowledge of relationships between nutrients, crop yield, and water quality;
- opinions about local streams and natural wildlife areas in the region; and
- types of recreation engaged in, as well as locations of those activities.

Results and discussion

The researchers identified a great deal of uncertainty surrounding water quality that helps explain why resident don't demand higher quality water supplies. First, many subjects assumed that the term "water quality" is used to describe only the quality of their drinking water rather than the broader interpretation used by technical experts. The majority of subjects questioned in this project believe they already have high-quality drinking water—helping to explain further their lack of demand for higher quality water supplies.

In contemplating impaired water quality, most subjects demonstrated a fairly low level of understanding about typical causes and sources of impaired conditions in watersheds such as Squaw Creek. Additionally, they held conflicting sets of expectations about what the quality of water in local streams and lakes should be—what was acceptable to one subject was likely to be unacceptable to another.

Another factor likely to complicate future watershed- and landscape-scale efforts was the relatively small range of spatial perceptions among the subjects. Most subjects were focused on landscape conditions very close to their home range and visibly struggled to contemplate the entire watershed basin.

Conclusions

Researchers formulated six conclusions based on their data from the project.

Water quality, as a concept, lacks a consistent meaning among subjects. There were different perceptions and definitions expressed by interviewees and experts. Therefore, when many subjects hear or read about water quality problems from a technical source, they are likely to attribute it to something very different than what is intended. This confusion likely will complicate water quality education and awareness efforts in the region.

In addition to varying definitions, subjects hold varying expectations of what water quality or condition is appropriate or necessary. This expectation in turn affects their perception of water quality. Some subjects were concerned with the need for a stream to drain their land, and this colored their perception of water conditions. Other subjects were interested in habitat or water recreation, which requires higher quality water conditions than mere drainage.

In addition to a lack of water quality monitoring data, there is considerable confusion about the causes and sources of the region's impaired water. Lack of information is responsible for some of the confusion, but some gaps in understanding follow patterns identified in other research. Some stakeholder groups underestimate the contributions of pollutants and land uses with which they can be associated, and overestimate the contributions of those factors with which they are not associated. Both situations (lack of knowledge and lack of responsibility for potential contributions to impairment) often occur where there have been no efforts at education and awareness.

Subjects associated with agriculture, in particular, appeared sensitive to the issues explored by this project and the interest areas of the watershed council. Many farmer subjects perceived that the council objectives would be/were in direct conflict with agriculture.

There is a conflict between the scale of spatial perceptions of many subjects and the nature of river corridor and watershed projects. Subjects related most closely (and observed changes) to the landscape very near where they live and work. This was especially true for farmer and rural residents surveyed. As such, they appeared to have difficulty—or not be interested in—thinking on a larger, regional scale.

Squaw Creek is important to a majority of the subjects who were interviewed. However, the importance seemed to be general in nature (i.e., streams are important in a general sense) rather than based on a strong emotional relationship (i.e., Squaw Creek is a vitally important place or element). The majority of the subjects in this project didn't rely on the stream for their livelihood and most are not

using it for recreation; hence, there was no strong bond between the people and the stream. Nor did researchers observe strong motivation to make changes to enhance stream conditions or quality.

Impact of results

The results of this research have already positively impacted the watershed. The Squaw Creek Watershed Council, local soil and water conservation districts, and Prairie Rivers Resource Conservation & Development (RC&D) are using the findings to structure water quality awareness campaigns among residents. The Council also has begun work to diminish the tension between rural and urban residents relative to water quality by focusing on urban areas close to Ames. The results of this assessment also function as a baseline measure of social conditions prior to structured education programs in the watershed. A repeat assessment several years in the future will identify the positive changes in awareness levels as well as shifting beliefs and perceptions resulting from education and communication efforts in the watershed.

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